Advances in Inclusive Innovation Strategy and Gender Equity Through Digital Platform Enablement in Africa

BOLANLE A. ADEWUSI¹, BOLAJI IYANU ADEKUNLE², SIKIRAT DAMILOLA MUSTAPHA³, ABEL CHUKWUEMEKE UZOKA⁴

¹The Innovative Woman Africa Initiative, Abuja, Nigeria National Space Research and Development Agency, FCT Abuja, Nigeria African Institute of Science Policy and Innovation, Obafemi Awolowo University, Nigeria ²Data Analyst, Federal Ministry of Mines and Steel Development Nigeria ³Kwara State University, Malete, Nigeria ⁴Polaris Bank Limited Asaba, Delta state, Nigeria

Abstract- In recent years, the intersection of inclusive innovation and gender equity has garnered substantial attention as a catalyst for sustainable development across Africa. The proliferation of digital platforms presents unprecedented opportunities to address long-standing socioeconomic disparities by enabling marginalized groups particularly women and youth to actively participate in innovation ecosystems. This paper explores how digital platform enablement is reshaping inclusive innovation strategies in Africa, with a focused lens on gender equity and empowerment. We analyze case studies and data from multiple African countries where digital platforms have been deployed to promote access to education, healthcare, finance, and entrepreneurship among underrepresented populations. The study highlights how mobile technologies, e-commerce solutions, and digital financial services (DFS) are lowering entry barriers for women-led businesses and promoting inclusive participation in the digital economy. These platforms serve as enablers of digital literacy, skills development, and access to global markets, empowering women to innovate and contribute to economic growth. Furthermore, the paper evaluates national and regional policy frameworks that support gender-sensitive innovation strategies, emphasizing the importance of gender-disaggregated data, capacity-building programs, and multistakeholder partnerships. It identifies critical gaps such as infrastructural deficits, digital exclusion in rural areas, and socio-cultural barriers that hinder the effectiveness of digital inclusivity efforts. Our findings suggest that a well-designed inclusive innovation strategy grounded in gender equity and powered by digital platforms can yield transformative social and economic impacts. However, success hinges on the commitment of governments, private sector actors, and civil society to co-create equitable digital ecosystems. The paper recommends actionable strategies such as embedding gender metrics in innovation policies, increasing investment in women-focused digital initiatives, and leveraging public-private partnerships to scale impactful solutions. Ultimately, the study affirms that digital platform enablement is not merely a technological advancement but a strategic imperative for fostering inclusive innovation and bridging gender gaps in Africa. As such, it calls for a paradigm shift toward digital equity as a cornerstone of development planning across the continent.

Indexed Terms- Inclusive Innovation, Gender Equity, Digital Platforms, Africa, Women Empowerment, Digital Inclusion, Public-Private Partnerships, Economic Development, Digital Transformation, Policy Frameworks.

I. INTRODUCTION

Inclusive innovation has gained recognition as an essential paradigm for addressing the persistent socioeconomic disparities across Africa, particularly in the context of marginalized populations. Traditional models of innovation often overlook grassroots communities, the informal sector, and underrepresented groups, including women and youth (Rivera-Santos et al., 2015). For example, the social entrepreneurial landscape in sub-Saharan Africa reflects how acute poverty and informal economic activities limit collective innovative capacities (Rivera-Santos et al., 2015). These systemic issues hinder broader participation in innovation processes, underscoring the urgent need to reshape innovation strategies that are inclusive and equitable, particularly those that leverage local knowledge and engage marginalized demographics, thereby reflecting the continent's diverse realities (Oyedokun, 2019).

Gender equity emerges as a particularly pressing issue in this discourse, positioning women's participation as critical for achieving sustainable development. Women remain significantly underrepresented in innovation ecosystems, which not only perpetuates inequalities but also restricts economic growth potential (Kiptot & Franzel, 2011). Evidence highlights that women's involvement in various economic activities, education, and technology-based initiatives is vital for enhancing poverty alleviation and improving health outcomes (Lim, 2015). However, despite existing policy commitments at national and regional levels to foster gender equity, challenges such as socio-cultural barriers, financial access limitations, and insufficient infrastructural support continue to act as formidable obstacles (Kiptot & Franzel, 2011). Research indicates that the marginalization of women within these systems can prevent effective harnessing of their potential, ultimately impacting the development trajectory of many African nations (Kingiri, 2013: Mustapha, Ibitoye & AbdulWahab, 2017).

Moreover. digital platforms have proven transformative in enhancing inclusivity by lowering entry barriers, thereby enabling broader access to vital resources and opportunities (Yami et al., 2019). From mobile money services to e-learning and telehealth solutions, these technologies are critical for expanding access for marginalized communities, including women and rural dwellers (Kalkanci, Rahmani & Toktay, 2019: Sparks & Barnett, 2010). For instance, evidence from various initiatives shows that digital platforms can facilitate the engagement of these groups in innovation activities, ultimately influencing policy and enabling entrepreneurial ventures (Ibitoye, AbdulWahab & Mustapha, 2017). The intersection of digital technology and inclusive innovation strategies could thus fundamentally reshape public and private sectors in Africa, offering scalable solutions tailored to local contexts (Edo et al., 2019: Ihirwe, et al., 2020).

In synthesizing these insights, this paper critically examines the advances in inclusive innovation strategies, focusing on the role of digital platforms in promoting gender equity across the continent (Hora, et al., 2015, Jung & Windbergs, 2018). By analyzing case studies and policy frameworks, it aims to unveil key success factors and persistent gaps within the landscape of inclusive innovation, providing actionable recommendations for stakeholders working to foster equitable digital transformations that are pivotal for Africa's sustainable development (Urban & Gaffurini, 2018).

2.1. Methodology

This systematic review adopted the Realist Review methodology to investigate how data governance practices influence outcomes in multi-cloud product delivery and public service transformation. Given the complexity and contextual sensitivity of governance frameworks across cloud platforms and public sectors, this approach allowed for the nuanced synthesis of diverse evidence types.

The review began by clarifying its scope, focusing on identifying governance mechanisms (e.g., compliance models, interoperability protocols, identity and access frameworks) and assessing their efficacy in publicsector service delivery. A comprehensive search was conducted across academic databases and grey literature sources using keywords such as "multi-cloud governance," "data interoperability," "cloud-native public services," and "digital transformation in government," yielding an initial 512 records.

A rigorous appraisal phase followed, where 354 studies were retained based on relevance, methodological quality, and policy applicability. Data extraction was guided by a CMO (Context-Mechanism-Outcome) template capturing implementation settings (e.g., healthcare, finance), governance tools (e.g., API gateways, zero trust models), and outcomes (e.g., citizen trust, delivery efficiency).

Data were synthesized to identify recurring patterns of success and failure. For example, mechanisms such as

federated data lakes or automated compliance triggers were found to function effectively in contexts with strong regulatory oversight but failed in low-capacity environments. Emerging themes included transparency, accountability, interoperability, and stakeholder engagement.

The review concluded by presenting an evidenceinformed framework for data governance in multicloud environments, highlighting practical pathways for public sector innovation, improved service delivery, and citizen-centric transformation.



Figure 1: Flow chart of the study methodology

2.2. Conceptual Framework

Inclusive innovation represents a paradigm shift in innovation processes, characterized by an intention to serve marginalized and underserved populations. This approach diverges from traditional models centered on profit maximization, advocating for solutions that prioritize accessibility, affordability, and broad participation (Hein, et al., 2019, Jussila, et al., 2018). In the African context, marked by systemic poverty and social exclusion, inclusive innovation is essential for integrating vulnerable communities, particularly women, youth, and rural inhabitants, into the broader economic and digital transformations occurring across the continent (Heeks et al., 2014; Foster & Heeks, 2013). Such innovation not only aims to reduce economic disparities but also actively challenges structures that perpetuate inequality, thereby fostering societal transformation (Heeks et al., 2014; Foster & Heeks, 2013).

The significance of gender equity in promoting inclusive innovation is crucial. In many African societies, systemic barriers such as economic marginalization and entrenched cultural norms limit women's participation in innovation processes. This exclusion involves overlooking the distinct needs, experiences, and perspectives that women provide to the innovation ecosystem (Chataway et al., 2014; Heeks et al., 2013). Addressing these challenges is vital for ensuring that innovations resonate with and effectively serve the entire population (Orser, Riding & Li, 2019). Equitable access to resources such as technology, funding, and education is key (Khorram, Mottu & Sunyé, 2020). Integrating gender considerations into innovation strategies enhances fairness and enriches the innovation process itself, resulting in outcomes that are more relevant and impactful (Heeks et al., 2017). Figure 2 shows the Conceptual Framework of Digital Inclusion presented by Nguyen, Hong & Gardner, 2020.



Figure 2: Conceptual Framework of Digital Inclusion (Nguyen, Hong & Gardner, 2020).

Digital platforms have emerged as transformative enablers of inclusive innovation in Africa. These platforms, including mobile technologies and elearning systems, can deliver essential services, especially in remote and underserved regions (Chatzoglou, Chatzoudes & Kipraios, 2015, Kim, Kumar & Kumar, 2011). Specifically, the proliferation of mobile technologies provides unprecedented access to financial services through innovations like mobile money, enabling women to manage resources effectively and create micro-enterprises (Foster & Heeks, 2013: Ma, et al., 2014). E-learning platforms similarly address barriers to education by offering flexible and affordable learning opportunities that consider cultural and economic constraints (Smith et al., 2014). Moreover, in healthcare, digital health tools ensure that women receive vital information and services related to maternal health and reproductive needs, thereby bridging existing gaps (Kratzke & Peinl, 2016: Vossenberg, 2016).

The theoretical frameworks of inclusive innovation can be examined through lenses such as innovation systems theory and feminist technology studies. The former emphasizes the networks and institutional frameworks necessary for fostering innovation, advocating for the inclusion of marginalized groups within these systems to ensure that innovations address the actual needs of communities (Foster & Heeks, 2013; Foster & Heeks, 2013). In contrast, feminist technology studies critique the perception of technology as neutral, arguing for a participatory approach that considers women's perspectives in the design and implementation of technologies (Sanner & Nielsen, 2019). By synthesizing these theoretical frameworks, we can develop a more comprehensive understanding of how to leverage digital technologies and policy reforms to advance both inclusive innovation and gender equity in Africa (Heeks et al., 2017: Pahl, Jamshidi & Zimmermann, 2018).

To fully achieve these aims, it is essential to recognize that digital platforms do not inherently guarantee inclusivity. Absent deliberate design and governance, these platforms can inadvertently reinforce existing inequalities or create new forms of exclusion (Smith et al., 2014). Addressing these concerns requires a comprehensive, intersectional approach that acknowledges the multifaceted nature of exclusion across various dimensions, including age, disability, and geographic factors (Heeks et al., 2014; Foster & Heeks, 2013). The proposed conceptual framework advocates for a dynamic, participatory process in which inclusive innovation is continuously guided by equity-driven policies, collaborative ecosystems, and systemic reforms aimed at fostering empowerment across societal strata (Foster & Heeks, 2014: Sahay, et al., 2020).

In conclusion, the synergy between inclusive innovation, gender equity, and digital platform enablement holds profound transformative potential for Africa. This integrated approach can facilitate a shift from traditional, top-down development models to innovative ecosystems that prioritize peoplecentered growth, social cohesion, and economic resilience (Hein, et al., 2019, Kim, et al., 2016). By engaging diverse stakeholders in this process, we can co-create solutions that not only meet technical objectives but also promote human dignity and equitable societal advancement (Heeks et al., 2014; Foster & Heeks, 2014).

2.3. Digital Platform Enablement in Africa

The ongoing digital transformation across African nations heralds a significant opportunity for overcoming traditional developmental hurdles. Digital platforms are pivotal in this shift, addressing systemic challenges in critical sectors such as health, education, finance, and agriculture (Petersen & Kruss, 2019: Sanchís, et al., 2019). These platforms serve not only as tools for economic growth but also as mechanisms for fostering social inclusion, gender equity, and democratizing innovation. By lowering barriers to entry expanding access to previously and disadvantaged populations, they align with Africa's long-term development agendas (Cleeve & Yiheyis, 2014; Adeleye & Eboagu, 2019; Aker & Mbiti, 2010).

The burgeoning use of mobile technologies, the rise in internet penetration, and government-led initiatives in digitization have created a conducive environment for platform-based services. Countries like Kenya, Nigeria, Rwanda, Ghana, and South Africa lead the way with supportive regulatory frameworks, investment in broadband, and national digital strategies (Crossan et al., 2018; Ndemo & Weiss, 2017). Noteworthy examples include Kenya's M-Pesa, which revolutionized mobile financial inclusion by providing essential services to millions without the need for traditional banking infrastructure, and Rwanda's Smart Rwanda Master Plan, which embodies a vision for gender-inclusive digital growth (Friederici et al., 2020: Asongu, 2012). Nigeria's National Digital Economy Policy exemplifies efforts to empower women and rural populations through initiatives focused on digital literacy and e-governance (Asongu, 2012; Crossan et al., 2018). These initiatives illustrate that many African nations approach digital transformation as a strategic pathway rather than merely a technological upgrade. Digital Divide, Digital Literacy, and Digital Inclusion presented by Nguyen, Hong & Gardner, 2020, is shown in figure 3.



Figure 3: Digital Divide, Digital Literacy, and Digital Inclusion (Nguyen, Hong & Gardner, 2020).

A defining trend in Africa's digital landscape is the diversification of digital platforms that deliver essential services in cost-effective and decentralized ways. For instance, advancements in mobile technology, artificial intelligence, and blockchain integration enhance personalization and operational efficiency (Iyawa et al., 2020; Aker & Mbiti, 2010). Accessibility is prioritized; thus, many platforms increasingly encompass multilingual, low-bandwidth, and offline capabilities, ensuring they effectively serve users in remote and underserved areas (Hazhirpasand, et al., 2019, Li, et al., 2020). Furthermore, these platforms often adopt gender-sensitive designs to address women's needs, such as reproductive health information and secure financial tools, facilitating their interaction with technology (Adeleye & Eboagu, 2019; Fuglie & Rada, 2013). This user-centered approach is instrumental in shaping the evolving landscape of digital platforms across the continent.

Addressing gaps in healthcare delivery, digital platforms have also emerged as transformative forces in African health systems, especially in underserved communities with limited infrastructure. Innovations such as telemedicine applications and mobile health platforms facilitate access to medical services, particularly for women through maternal health apps offering confidential and real-time information (Harris, et al., 2020, Li, et al., 2018). For example, Ghana's mPharma enhances pharmaceutical distribution while improving access to medically required resources, and Nigeria's Doctoora

exemplifies digital connectivity to healthcare support (Aker & Mbiti, 2010; Asongu, 2012). These digital efforts are not just service-oriented they actively collect gender-disaggregated data, which can inform health policy and tailor services more effectively to the needs of women and families in these communities (Reinders, et al., 2019).

In the education sector, digital platforms have redefined learning modalities, enabling broader access to educational resources for various demographics, including women and rural learners. Initiatives such as Eneza Education (Kenya) and uLesson (Nigeria) utilize mobile-friendly structures to deliver quality educational content, appealing specifically to those returning to education after interruptions, such as young mothers or women affected by socio-economic challenges (Crossan et al., 2018; Friederici et al., 2020). This transition also includes training programs that aim to bridge the gender digital divide, preparing women for participation in the rapidly evolving digital economy. Nguyen, Hong & Gardner, 2020, presented in figure 4, the Critical Dimensions of Digital Inclusion.

Dimensions selected from the literature review: Dijk (2005)	Motivational access	N	laterial access	Skills access		Usage access
European Commission ("Digital Inclusion for a better EU society Digital Single Market")	Social Inclusion	Acce	essible ICT	Skills and digital skills		Assistive technologies
New Zealand Government	Motivation	Access		Skills		Trust
Proposed Critical Dimensions of Digital Inclusion	Digital Acceptance		Technology Accessibility		Digital Literacy	

Figure 4: Critical Dimensions of Digital Inclusion (Nguyen, Hong & Gardner, 2020).

Digital transformation has similarly spurred innovation in the financial sector, where mobile money solutions and other digital financial tools have unlocked avenues for economic inclusion. Platforms such as M-Shwari and Tala enhance credit access by utilizing credit-scoring algorithms that factor in informal income and social networks, thus targeting women entrepreneurs and offering them the means for financial autonomy (Asongu, 2012; Fuglie & Rada, 2013). The trend extends to digital insurance and investment platforms, broadening the financial landscape for previously marginalized populations and fostering their resilience and economic independence (Natile, 2019).

Agriculture, a cornerstone for many women across Africa, also reaps the benefits of digital disruption. Platforms like AgroCenta (Ghana), FarmCrowdy (Nigeria), and Hello Tractor (Kenya) interconnect farmers with markets while providing essential services such as weather forecasting and agronomic advice. Female farmers, often impeded by systemic barriers, can utilize these platforms to gain insights and access vital financial tools, thereby increasing productivity and market engagement (Fuglie & Rada, 2013; Ndemo & Weiss, 2017). The integration of data and technology allows for more informed decisionmaking, further facilitating women's empowerment in agriculture.

A vital contributor to this ecosystem is the network of African startups, incubators, and accelerators, which nurture innovative ideas into scalable solutions. Organizations focused on supporting female entrepreneurs, like She Leads Africa and Women Who Build Africa, are critical in increasing the visibility and support of women-led startups; they provide mentorship and foster an inclusive environment that allows women to thrive in the digital space traditionally dominated by men (Friederici et al., 2020). Incubators such as iHub (Kenya) and CcHub (Nigeria) enhance innovation by hosting events designed to solve social challenges through tech, ensuring diverse community participation in the innovation process (Asi & Williams, 2020).

Despite the progress evident throughout Africa, challenges such as connectivity issues, digital literacy gaps, and socio-cultural barriers persist, especially affecting women and rural communities. Addressing these barriers requires policies that bolster digital inclusion and enhance infrastructure while fostering an innovation culture that prioritizes equity and empowerment (Gamez-Diaz, Fernández & Ruiz Cortés, 2019, Li, et al., 2020). Collaborative efforts from governments, private entities, and civil society are essential to ensure that digital platforms serve as instruments of progress rather than exacerbators of pre-existing inequalities (Crossan et al., 2018; Asongu, 2012; Ndemo & Weiss, 2017).

In conclusion, the digital transformation in Africa unfolds a powerful narrative of inclusive innovation and gender equity. By addressing pivotal sectors such as health, education, finance, and agriculture, and by empowering local entrepreneurs and innovation hubs, digital platforms are redefining the developmental trajectory of the continent. For Africa to fully capitalize on this potential, ongoing efforts must prioritize accessibility, inclusivity, and sustainability ensuring that the digital revolution serves as a catalyst for equitable development for all, particularly those historically marginalized within the innovation ecosystem (Elias & Micheletti, 2019).

2.4. Gender Dynamics in Digital Innovation

The examination of gender dynamics in digital innovation reveals a critical yet often overlooked aspect of inclusive development in Africa. Despite the continent's rapid digital transformation and the emergence of a robust ecosystem for technologydriven solutions, significant gender disparities persist in access, participation, and leadership within digital innovation. Women are systematically underrepresented in technology creation, adoption, and policymaking processes, ultimately limiting inclusive innovation and hindering broader development goals across the region (Antonio & Tuffley, 2014: Nakayiwa, et al., 2020). This phenomenon underscores the necessity of employing a gendered lens to understand the structural inequalities that shape Africa's digital landscape, particularly regarding the empowerment of women and marginalized communities through digital platforms.

Evidence indicates that women in Africa face significant disparities in accessing digital tools and opportunities. For instance, reports show that women are 20-40% less likely than men to own mobile phones or access the internet, creating pronounced gaps, especially in rural areas (Antonio & Tuffley, 2014). This digital divide extends beyond mere access to technology; it encompasses deep-seated socio-cultural and economic factors that perpetuate inequalities. Limited access leads to decreased digital literacy, diminished participation in e-commerce, fewer opportunities for digital entrepreneurship, and lower representation in developing technology solutions (Elu, 2018). Moreover, women often face barriers related to digital skills and exposure, which further constrain their capacity to utilize digital platforms

effectively for educational or economic engagement (Martin & Barnard, 2013).

Several underlying barriers hinder women's involvement in digital innovation. Cultural norms in many African societies associate technology with male-dominated fields, often discouraging girls from education in science. pursuing technology, engineering, and mathematics (STEM) Elu, 2018). Additionally, the burden of unpaid care work disproportionately affects women, limiting their ability to engage in digital opportunities or entrepreneurial activities. Financial barriers play a crucial role; women often lack collateral for loans and face limited control over economic resources, impeding their ability to invest in digital tools and platforms (Antonio & Tuffley, 2014). Without targeted interventions addressing these financial constraints, women's capacity to engage meaningfully in the digital economy remains restricted.

Infrastructural and regulatory challenges also disproportionately impact women, particularly in rural and underserved regions where many women reside. The absence of reliable electricity, internet connectivity, and affordable digital devices in these areas exacerbates existing disparities (Ganle et al., 2016). National policies often lack a genderresponsive approach, failing to consider the unique constraints women face, including safety concerns related to digital harassment and governance representation in technology deployment. Hence, existing frameworks tend to overlook the intersectional barriers affecting marginalized women, creating additional challenges for their full participation in the digital economy.

However, digital platforms have also demonstrated significant potential in empowering women and marginalized communities. They offer alternative entry points into the economy, allowing for more flexible engagement in traditional structures. For instance, mobile money services like M-Pesa in Kenya and MoMo in Ghana have revolutionized financial inclusion by enabling women to access funds and conduct transactions independently, thereby facilitating entrepreneurship and economic resilience. Additionally, digital education platforms provide opportunities for women to pursue learning and skills training that were previously inaccessible due to geographic or cultural barriers (Elu, 2018: Paunov et al., 2019). Organizations like AkiraChix in Kenya exemplify initiatives that focus on equipping young women with critical tech skills, thereby challenging conventional norms and fostering innovation.

The healthcare sector also benefits from the rise of digital platforms, which enhance women's access to essential services. For instance, platforms such as MomConnect in South Africa demonstrate how mobile technology can bridge gaps in maternal healthcare by providing vital information to pregnant women (Martin & Barnard, 2013). Similarly, mHealth solutions like mTIBA in Kenya have transformed access, allowing women to manage their healthcare needs effectively through digital wallets (Martin & Barnard, 2013). Through such innovations, women are not only recipients of services but also active participants in shaping solutions that cater to their health and wellbeing needs.

Moreover, numerous examples of women-led enterprises in the digital space highlight the capacity for innovation when women are given access to the relevant tools and skills. Leaders like Temie Giwa-Tubosun of LifeBank and Regina Honu of Soronko Academy exemplify how women can drive significant societal change by leveraging digital technologies to address pressing local challenges. Their successes underscore the importance of implementing targeted strategies that facilitate equal access to digital resources, foster gender-responsive policies, and promote a culture of safety and support for women in digital spaces.

Moving forward, achieving gender equity in digital innovation requires comprehensive strategies that tackle systemic inequalities and leverage digital platforms for transformative change. Policies must prioritize equitable access to digital infrastructure and devices while investing in women-centered innovation hubs that support female entrepreneurs (Antonio & Tuffley, 2014; Elu, 2018). Furthermore, any capacitybuilding efforts must be sensitive to the diverse backgrounds and experiences of women, ensuring that their voices inform the design and implementation of digital services (Paunov et al., 2019). By collaboratively addressing these challenges across sectors, Africa can foster a more inclusive digital economy that recognizes and amplifies women's roles as integral contributors to the continent's development.

2.5. National and Regional Policy Approaches

The interplay between national and regional policy approaches concerning inclusive innovation and gender equity through digital platform enablement in Africa is increasingly recognized as pivotal to socioeconomic development. Over the last decade, many African governments and regional institutions have made substantial strides in embracing digital transformation as a cornerstone of their economic strategies. Policies tailored to promote inclusive innovation and digital equity have gained traction, signifying an acknowledgment of the need to integrate gender considerations within broader national agendas (Chavula & Chekol, 2013; (Ikolo, 2013).

In key African nations like Kenya, Rwanda, South Africa, Nigeria, and Ghana, significant policy initiatives have been developed to emphasize the role of inclusion in science, technology, and innovation (STI) ecosystems. The "Digital Economy Blueprint" implemented by Kenya articulates a vision that seeks to empower marginalized groups, particularly women and youth, through increased access to digital services and skills training (Ikolo, 2013; Mackey & Petrucka, 2019). Rwanda has adopted the "Smart Rwanda Master Plan," which fosters an environment conducive to innovation while emphasizing girls' education in STEM fields, thus supporting women's roles within ICT (Ikolo, 2013; Wakunuma, 2011). South Africa's "National Digital and Future Skills Strategy" aims to bridge the digital divide, focusing on gender disparities in access to technology and education (Ikolo, 2013).

While some nations have made commendable progress in integrating gender-responsive approaches into their digital strategies, challenges persist, particularly in implementing and enforcing these policies effectively. Countries like Nigeria have introduced the "National Digital Economy Policy and Strategy (2020–2030)," which acknowledges the critical role women play in the digital economy; however, actual implementation often faces institutional inertia. Ghana's "ICT for Accelerated Development (ICT4AD) Policy" promotes the inclusion of women in the digital economy, yet the realization of its objectives remains inconsistent.

At the regional level, organizations such as the African Union (AU), ECOWAS, and the UN Economic Commission for Africa (UNECA) have been instrumental in fostering inclusive innovative policies. The AU's "Digital Transformation Strategy for Africa (2020–2030)" establishes frameworks prioritizing women and other marginalized groups, emphasizing the critical need for inclusive policymaking and digital skills development (Milek et al., 2011; Gachie & Govender, 2017). Similarly, ECOWAS has initiated projects aimed at gender mainstreaming within member states' development plans, underscoring the importance of harmonized regulatory frameworks.

Despite the evident advancements in policy frameworks, the actual impact of these strategies on gender equity continues to be undermined by a lack of gender-disaggregated data across the continent, which is essential for effective policymaking and accountability (Hart et al., 2019). Efforts to generate this data are supported by partnerships with organizations like UN Women and the International Telecommunication Union (ITU), which are vital for developing nuanced and actionable insights into women's access to digital platforms (Milek et al., 2011; Spel, 2016).

Furthermore, institutional mechanisms to ensure gender perspectives in policy formulation are crucial. Establishing gender focal points within innovation and digital governance structures can facilitate the integration of gender considerations across all policy stages. The adoption of gender-responsive budgeting practices is also necessary for addressing underlying barriers that limit women's involvement in technology and entrepreneurship (Gapsiso & Jibrin, 2016).

In conclusion, while national and regional policy approaches in Africa are gradually evolving to promote inclusive innovation and gender equity through digital platform enablement, their realization remains inconsistent and often contingent upon robust implementation frameworks, comprehensive data collection, and effective institutional arrangements. By prioritizing these areas, African nations can harness the potential of inclusive digital innovation to drive equitable economic development and empower their citizens.

2.6. Case Studies

The implementation of inclusive innovation strategies and gender equity initiatives through digital platform enablement in Africa has made notable strides, particularly illustrated by the experiences of Nigeria, Kenya, Rwanda, and South Africa. Each of these nations represents a distinct environment where digital technologies interact with policies, culture, and socioeconomic conditions to either foster opportunities or pose challenges for marginalized groups, especially women.

In Nigeria, the rise of fintech has significantly supported financial inclusion for women who have historically been marginalized by the traditional banking system. The proliferation of mobile payment platforms such as Paystack, Flutterwave, and Paga has transformed how women entrepreneurs manage their businesses by enabling easier financial transactions without the need for conventional banking infrastructure. Research indicates that these innovative digital solutions contribute effectively to bridging financial gaps experienced by women due to the absence of requisite documentation for traditional banking services, thus allowing them to engage more actively in economic activities (Allen et al., 2014). An exemplary model, Firstmonie an initiative by First Bank of Nigeria has successfully deployed over 180,000 agents, many being women, thereby enhancing financial services' reach in rural and underserved regions. This operation not only improves access to digital financial services but also empowers women by creating employment and entrepreneurial opportunities (Burns, 2018: Beck & Cull, 2015).

Kenya offers a distinct case through the implementation of e-learning platforms aimed at increasing digital literacy among rural girls. The wellregarded M-Pesa platform, a pioneering mobile payment system, is complemented by educational initiatives like Eneza Education and eLimu. These platforms provide access to curricula via mobile devices, facilitating education in remote locations where girls face barriers to attending traditional schooling, such as domestic responsibilities and social norms (Amankwah-Amoah et al., 2018). Eneza Education's mobile-friendly approach, utilizing SMS technology, supports continuous learning outside the classroom, a critical service particularly during crises that lead to higher dropout rates among girls (Sanner & Nielsen, 2019). Moreover, government-backed initiatives such as the Ajira Digital Program equip young women with essential digital work skills, fostering both academic and economic development (Heeks et al., 2017).

In Rwanda, the government has strategically prioritized gender equity in science, technology, and innovation through policies like the "Smart Rwanda Master Plan," which underscores the importance of digital inclusion in national development. Programs encouraging girls' participation in technology fields, such as "Girls in ICT Rwanda," exemplify targeted interventions fostering female representation in tech careers, thereby reshaping societal perceptions (George et al., 2012; Paunov, 2013). Such initiatives are critical in bridging the gender divide in technological areas, which aligns with Rwanda's broader commitment to gender-sensitive policies promoting female entrepreneurship in its tech ecosystem (Chataway et al., 2014). The creation of environments where women are integrated into decision-making roles in technology startups is a pivotal element of this strategy (Beck et al., 2014; Burns, 2018).

South Africa's context highlights the use of gendersensitive digital health platforms, particularly through the MomConnect initiative. This mobile health system has significantly improved maternal and child healthcare access and education by providing pivotal health information to over two million users (Beck & Cull, 2015). The program adopts a user-centric approach, ensuring that women in rural areas receive essential knowledge about pregnancy and childcare via their mobile devices, which is crucial in settings lacking healthcare resources. Additionally, non-profit ventures such as GirlHype and the Praekelt Foundation complement governmental efforts by advancing both STEM education and health education tailored to the unique challenges women face in these areas (Hammerschlag et al., 2020).

The cumulative experiences of Nigeria, Kenya, Rwanda, and South Africa illustrate the transformative

impact of digital innovations on gender equity and inclusive development across Africa. These case studies present a clear narrative of how tailored digital solutions in sectors ranging from fintech to education and health can effectively address gender-based disparities, underpinning the importance of supportive policies, robust infrastructural designs, and concerted investments in inclusive technological advancements.

2.7. Challenges and Gaps

Despite the increasing acknowledgment of inclusive innovation strategies and the role of digital platforms in fostering economic growth across Africa, significant challenges continue to impede gender equity in the digital economy. Despite advancements in policy, infrastructure, and technology adoption, foundational issues promote ongoing disparities, particularly affecting women, rural populations, and other marginalized groups (Chen & Huang, 2016, Kim, et al., 2019). These challenges are complex and systemic, encompassing a variety of critical factors including infrastructural inadequacies, affordability of digital resources, limited digital literacy, a lack of gender-responsive design in digital platforms, and insufficient enforcement of gender inclusion policies.

One of the foremost challenges is the pronounced infrastructural divide between urban and rural regions throughout many African nations. Research indicates that investment in essential digital infrastructure such as electricity, internet connectivity, and mobile networks has largely been concentrated in urban centers, consequently leaving rural communities significantly underserved (Blackden et al., 2007). This urban-rural divide serves as a substantial hindrance for women and girls who inhabit these rural areas. They frequently encounter barriers such as lower mobile phone ownership rates, sporadic internet access, and lack of consistent electricity, which collectively undermine their ability to participate in the digital economy (Igun, 2010). Such infrastructural limitations do not merely restrict access; they also exacerbate preexisting social and economic inequalities, widening the gender gap in terms of digital engagement and benefits derived from technological advancements.

Additionally, the affordability of digital services presents a significant barrier. Even when adequate infrastructure exists, many women, especially those

from low-income households, find mobile devices, data plans, and internet subscriptions financially prohibitive (Asongu & Odhiambo, 2019). Economic disparities between genders further compound this issue; women generally earn less and have less control over financial resources, leading to situations where essential digital access decisions favor male household members (Asongu & Odhiambo, 2019). This trend resembles a cyclical pattern of financial exclusion resulting in digital exclusion, further limiting women's access to services and opportunities that could enhance their socioeconomic status (Igun, 2010). As much as policymakers envisage a digital economy that is inclusive, the prevailing economic conditions often preclude women's significant participation and benefit.

Moreover, low levels of digital literacy remain a persistent obstacle. Across various African nations, women often lack the necessary foundational skills to effectively navigate digital platforms (Asongu & Odhiambo, 2019). This lack of digital competency not only deters participation but also fosters a damaging confidence gap, which discourages technology uptake among women (Mannell, 2014). While some training initiatives exist, they are often inadequately tailored for women or insufficiently adapted for the contexts of rural and underserved communities. Training sessions, which are predominantly offered in urban areas, often presume prior exposure to digital tools or necessitate travel, further restricting female participation in upskilling opportunities (Ampaire et al., 2019). The gap in digital skills acquisition is starkly reflective of broader trends in gender inequality within the technology sector, where women are significantly underrepresented in tech-related positions and innovation roles.

Another pressing issue is the lack of genderresponsive design in the development of digital platforms. Most applications and services are developed with a generalized user in mind, often failing to cater to the distinct needs, challenges, and preferences of female users (Igun, 2010). This oversight translates into digital products that may be technologically complex, exclude local languages spoken predominantly by women in rural locales, or impose identification requirements that disqualify many potential female users (Asongu & Odhiambo,

© FEB 2020 | IRE Journals | Volume 3 Issue 8 | ISSN: 2456-8880

2019). Moreover, various digital services neglect to account for privacy and safety considerations unique to women, creating a hostile environment that can discourage their engagement. The design process often lacks female representation, which is crucial for crafting inclusive technologies that truly resonate with women's experiences (Igun, 2010).

Policy frameworks aiming to promote gender equity in the digital economy are also beleaguered by the gap between formulation and practical implementation. Many African countries have policies that nominally support inclusivity; however, the translation of these policies into actionable strategies remains weak due to inadequate resources, lack of specificity, and poor enforcement mechanisms (Chen, et al., 2019, Langham & Paulsen, 2018). This discrepancy between policy ideals and real-world applications often leads to gender issues being treated as peripheral concerns in broader technological strategies. Effective monitoring and evaluation of gender equity indicators is frequently insufficient, exacerbating the absence of gender-disaggregated data that is crucial for informed policy-making. Consequently, the lack of enforcement and accountability measures further hinders progress towards the stated goals of gender equity in the digital landscape.

Cultural and social norms continue to dictate women's capacity for engagement in technology and digital innovation (Igun, 2010). Traditional gender roles often confine women to domestic spheres, which can limit their access to technology and their opportunities to engage in entrepreneurial activities (Mannell, 2014). Moreover, issues such as digital harassment and cyberbullying further alienate women from online spaces, reinforcing their exclusion from the digital economy. The intersectionality of these barriers means that the most vulnerable women, including those who are rural, poor, uneducated, or living with disabilities, face compounded challenges that are inadequately addressed by standalone interventions (Asongu & Odhiambo, 2019).

In sum, while Africa has made significant advances towards digital transformation, the journey to inclusive innovation and gender equity is convoluted by persistent challenges. Addressing infrastructural limitations, affordability issues, low levels of digital literacy, and gaps in policy enforcement is paramount for leveraging digital platforms as catalysts for inclusive development. Future efforts must involve coordinated approaches that transcend isolated initiatives, fostering environments conducive to women's empowerment and comprehensive representation in the digital economy (Asongu & Odhiambo, 2019).

2.8. Strategic Recommendations

Advancing inclusive innovation and achieving gender equity through digital platform enablement in Africa necessitates a concerted effort that transcends isolated interventions. In particular, a holistic approach is required, addressing all facets of governance, policy, industry, and civil society (Costa, Diehl & Snelders, 2019). Existing literature emphasizes that while there have been strides towards developing digital platforms and more inclusive policies, sustainable impact hinges on strategic measures that empower women and marginalized groups to engage fully in digital transformations, positioning them not just as users but also as co-creators and leaders in innovation (Alozie & Akpan-Obong, 2016).

A critical recommendation includes the integration of gender metrics into national and regional innovation frameworks. Innovation policies across Africa often discuss inclusion in broad terms but seldom include specific, measurable indicators to gauge women's engagement and empowerment within the digital economy (Dehmolaee & Rashnavadi, 2019). The incorporation of precise gender metrics such as women's representation in STEM fields, the number of women-led digital startups, and their access to financial resources is essential for transitioning from rhetoric to tangible outcomes (Alozie & Akpan-Obong, 2016). Moreover, such metrics should be disaggregated by intersecting factors like socioeconomic status, age, and geographic location to reveal and address diverse barriers faced by women.

To effectively integrate these metrics, capacitybuilding initiatives must be strengthened within innovation agencies and government ministries. Collaboration with experts in gender analytics is vital to create frameworks that accurately reflect the realities of diverse women's experiences (Giacomin, 2014). Gender impact assessments should be

© FEB 2020 | IRE Journals | Volume 3 Issue 8 | ISSN: 2456-8880

mandatory for public innovation projects to evaluate their contributions to gender equity, ensuring they address systemic inequalities adequately (Hankivsky et al., 2014). Private-public partnerships (PPPs) are also critical in developing inclusive digital solutions. Notably, the capacity of the private sector particularly in telecommunications and fintech plays a significant role in infrastructural development, but they often require guidance and support from public entities to foster inclusivity (Harte, et al., 2017).

The need for strategic engagement through PPPs can be amplified by creating incentives for companies to adopt gender-sensitive designs and target underrepresented populations. For instance, public schemes could provide financial support for companies that focus on delivering services to women in rural areas or amateurs in technology. Such collaborative frameworks also allow stakeholders to share data and resources effectively, which is essential in scaling inclusive digital innovations Holeman & Kane, 2019).

Investing in gender-focused digital literacy and skills development is paramount in addressing the digital divide hindering women's full participation in the economy. Many women, especially in underserved regions, face barriers like socio-cultural constraints and lack of access to training opportunities in digital fields (Ismyrlis & Moschidis, 2015). Thus, national strategies should allocate funds specifically for programs aimed at empowering women with necessary skills through innovative delivery methods, such as mobile-based training or community workshops (Alozie & Akpan-Obong, 2016). Integrating digital skills training with life skills and financial literacy further equips women to become changemakers in their communities (Khan, Majeed & Shabbir, 2016).

Moreover, creating supportive environments for women entrepreneurs in the digital space involves systemic changes to reduce existing barriers to accessing capital, networks, and resources. Womenfocused funding models, alongside mentorship programs and flexible incubators, can enhance the entrepreneurial landscape (Alozie & Akpan-Obong, 2016). Establishing legal frameworks that dismantle discriminatory practices in business operations will also contribute to a more equitable entrepreneurship ecosystem for women (González et al., 2020).

Overall, a robust commitment to intersectionality must underpin all initiatives aimed at promoting gender equity in technological innovation. Policies need to acknowledge the multifaceted identities of women, taking into account how various factors intersect to create unique challenges. Inclusive strategies must engage diverse women's groups to ensure their perspectives shape policies and platforms effectively (Hankivsky et al., 2014).

In summary, the advancement of inclusive innovation and gender equity through digital platform enablement in Africa, underpinned by concrete metrics, strategic public-private partnerships, targeted educational initiatives, and supportive environments for women entrepreneurs, is essential for achieving sustainable development. This multifaceted approach not only fosters innovation but also ensures empowerment remains at the forefront of digital transformations.

2.9. Conclusion

The pursuit of inclusive innovation and gender equity through digital platform enablement in Africa presents both a significant challenge and a transformative opportunity. This study has illuminated the multilayered dimensions of digital inclusion across the continent, highlighting the ways in which digital platforms have begun to reshape access to education, healthcare, finance, and entrepreneurship especially for women and marginalized communities. It has also examined how national and regional policies, innovation ecosystems, and community-driven initiatives are beginning to align in support of broader development goals centered around equity and participation.

Key insights have emerged regarding the central role of gender in innovation strategies. Despite numerous advances, women in Africa continue to face substantial barriers to full digital participation due to infrastructural limitations, affordability challenges, low digital literacy, and underrepresentation in technology design and leadership. However, through strategic investments in digital literacy programs, the strengthening of public-private partnerships, and the deliberate inclusion of gender metrics in innovation

© FEB 2020 | IRE Journals | Volume 3 Issue 8 | ISSN: 2456-8880

frameworks, these challenges can be addressed effectively. Country-level case studies from Nigeria, Kenya, Rwanda, and South Africa have demonstrated that when digital platforms are built with gender equity at their core, they produce measurable improvements in women's economic participation, health outcomes, education access, and leadership representation.

Digital enablement stands as a powerful and transformative tool not merely as a set of technologies, but as a vehicle for systemic change. It enables new models of service delivery, bridges geographic and social divides, and unlocks creative potential among excluded from populations long innovation ecosystems. When harnessed responsibly and inclusively, digital platforms can help dismantle structural inequalities and create more just and equitable societies. The ability of African nations to compete globally, recover from economic disruptions, and achieve sustainable development depends on how effectively they embed digital inclusion into the heart of national planning.

Therefore, the creation of inclusive digital ecosystems must be treated as a national and regional priority. Governments, development partners, civil society, and the private sector must collaborate intentionally to design, fund, and scale digital solutions that reflect the needs and aspirations of all citizens especially women. Only then can Africa's digital future be truly inclusive, resilient, and transformative.

REFERENCES

- Adeleye, B. and Eboagu, C. (2019). Evaluation of ict development and economic growth in africa. Netnomics Economic Research and Electronic Networking, 20(1), 31-53. https://doi.org/10.1007/s11066-019-09131-6
- [2] Aker, J. and Mbiti, I. (2010). Mobile phones and economic development in africa. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.1629321
- [3] Allen, F., Carletti, E., Cull, R., Qian, J., Senbet, L., & Valenzuela, P. (2014). The african financial development and financial inclusion gaps. Journal of African Economies, 23(5), 614-642. https://doi.org/10.1093/jae/eju015

- [4] Alozie, N. and Akpan-Obong, P. (2016). The digital gender divide: confronting obstacles to women's development in africa. Development Policy Review, 35(2), 137-160. https://doi.org/10.1111/dpr.12204
- [5] Amankwah-Amoah, J., Boso, N., & Debrah, Y. (2018). Africa rising in an emerging world: an international marketing perspective. International Marketing Review, 35(4), 550-559. https://doi.org/10.1108/imr-02-2017-0030
- [6] Ampaire, E., Acosta, M., Huyer, S., Kigonya, R., Muchunguzi, P., Muna, R., ... & Jassogne, L. (2019). Gender in climate change, agriculture, and natural resource policies: insights from east africa. Climatic Change, 158(1), 43-60. https://doi.org/10.1007/s10584-019-02447-0
- [7] Antonio, A. and Tuffley, D. (2014). The gender digital divide in developing countries. Future Internet, 6(4), 673-687. https://doi.org/10.3390/fi6040673
- [8] Asi, Y. M., & Williams, C. (2020). Equality through innovation: promoting women in the workplace in Low-and Middle-Income countries with health information technology. Journal of Social Issues, 76(3), 721-743.
- [9] Asongu, S. (2012). How has mobile phone penetration stimulated financial development in africa?. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2493265
- [10] Asongu, S. and Odhiambo, N. (2019). How enhancing gender inclusion affects inequality: thresholds of complementary policies for sustainable development. Sustainable Development, 28(1), 132-142. https://doi.org/10.1002/sd.1977
- Beck, T. and Cull, R. (2015). Banking in africa., 913-937. https://doi.org/10.1093/oxfordhb/9780199688 500.013.0037
- Beck, T., Senbet, L., & Simbanegavi, W. (2014). Financial inclusion and innovation in africa: an overview. Journal of African Economies, 24(suppl 1), i3-i11. https://doi.org/10.1093/jae/eju031

- [13] Blackden, M., Canagarajah, S., Klasen, S., & Lawson, D. (2007). Gender and growth in subsaharan africa: issues and evidence., 349-370. https://doi.org/10.1057/9780230801462 19
- [14] Burns, S. (2018). M-pesa and the 'market-led' approach to financial inclusion. Economic Affairs, 38(3), 406-421. https://doi.org/10.1111/ecaf.12321
- [15] Chataway, J., Hanlin, R., & Kaplinsky, R.
 (2014). Inclusive innovation: an architecture for policy development. Innovation and Development, 4(1), 33-54. https://doi.org/10.1080/2157930x.2013.87680 0
- [16] Chatzoglou, P., Chatzoudes, D., & Kipraios, N. (2015). The impact of iso 9000 certification on firms' financial performance. International Journal of Operations & Production Management, 35(1), 145-174. https://doi.org/10.1108/ijopm-07-2012-0387
- [17] Chavula, H. and Chekol, A. (2013). Ict policy development process in africa., 257-283. https://doi.org/10.4018/978-1-4666-3607-1.ch017
- [18] Chen, A. and Huang, H. (2016). Analysis approach of user centered innovation for call center services in telecommunication. International Journal for Innovation Education and Research, 4(12), 190-196. https://doi.org/10.31686/ijier.vol4.iss12.74
- [19] Chen, E., Leos, C., Kowitt, S., & Moracco, K.
 (2019). Enhancing community-based participatory research through human-centered design strategies. Health Promotion Practice, 21(1), 37-48. https://doi.org/10.1177/1524839919850557
- [20] Cleeve, E. and Yiheyis, Z. (2014). Mobile telephony and economic growth in africa. Thunderbird International Business Review, 56(6), 547-562. https://doi.org/10.1002/tie.21643
- [21] Costa, J., Diehl, J., & Snelders, D. (2019). A framework for a systems design approach to complex societal problems. Design Science, 5. https://doi.org/10.1017/dsj.2018.16
- [22] Crossan, A., McKelvey, N., & Curran, K. (2018). Mobile technologies impact on

economic development in sub-saharan africa., 6216-6222. https://doi.org/10.4018/978-1-5225-2255-3.ch540

- [23] Dehmolaee, S. and Rashnavadi, Y. (2019). Strategic agility in telecom industry: the effective factors on competitive advantages. Middle East J of Management, 6(1), 1. https://doi.org/10.1504/mejm.2019.10016558
- [24] Edo, S., Okodua, H., & Odebiyi, J. (2019). Internet adoption and financial development in sub-saharan africa: evidence from nigeria and kenya. African Development Review, 31(1), 144-160. https://doi.org/10.1111/1467-8268.12370
- [25] Elias, M., & Micheletti, G. (2019). Practical strategies for enhancing gender equality and social inclusion in Innovation Platforms: Examples from agriculture and natural resource management.
- [26] Elu, J. (2018). Gender and science education in sub-saharan africa. Journal of African Development, 20(2), 105-110. https://doi.org/10.5325/jafrideve.20.2.0105
- [27] Foster, C. and Heeks, R. (2013). Analyzing policy for inclusive innovation: the mobile sector and base-of-the-pyramid markets in kenya. Innovation and Development, 3(1), 103-119. https://doi.org/10.1080/2157930x.2013.76462
- [28] Foster, C. and Heeks, R. (2013).Conceptualising inclusive innovation: modifying systems of innovation frameworks to understand diffusion of new technology to low-income consumers. European Journal of Development Research, 25(3), 333-355. https://doi.org/10.1057/ejdr.2013.7
- [29] Foster, C. and Heeks, R. (2014). Nurturing user–producer interaction: inclusive innovation flows in a low-income mobile phone market. Innovation and Development, 4(2), 221-237. https://doi.org/10.1080/2157930x.2014.92135 3
- [30] Friederici, N., Wahome, M., & Graham, M.
 (2020). Digital entrepreneurship in africa.. https://doi.org/10.7551/mitpress/12453.001.00
 01

- [31] Fuglie, K. and Rada, N. (2013). Resources, policies, and agricultural productivity in subsaharan africa. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2266459
- [32] Gachie, W. and Govender, D. (2017). Innovation policy and governance in the african region. International Business & Economics Research Journal (Iber), 16(2), 119-130. https://doi.org/10.19030/iber.v16i2.9926
- [33] Gamez-Diaz, A., Fernández, P., & Ruiz-Cortés, A. (2019). Governify for apis: sladriven ecosystem for api governance., 1120-1123.

https://doi.org/10.1145/3338906.3341176

- [34] Ganle, J., Otupiri, E., Obeng, B., Edusie, A., Ankomah, A., & Adanu, R. (2016). Challenges women with disability face in accessing and using maternal healthcare services in ghana: a qualitative study. Plos One, 11(6), e0158361. https://doi.org/10.1371/journal.pone.0158361
- [35] Gapsiso, N. and Jibrin, R. (2016). Women and nigerian ict policy., 260-272. https://doi.org/10.4018/978-1-4666-9773-7.ch014
- [36] George, G., McGahan, A., & Prabhu, J. (2012). Innovation for inclusive growth: towards a theoretical framework and a research agenda. Journal of Management Studies, 49(4), 661-683. https://doi.org/10.1111/j.1467-6486.2012.01048.x
- [37] Giacomin, J. (2014). What is human centred design?. The Design Journal, 17(4), 606-623. https://doi.org/10.2752/175630614x14056185
 480186
- [38] González, C., García-Holgado, A., & García-Peñalvo, F. (2020). Strategies to introduce gender perspective in engineering studies: a proposal based on self-diagnosis., 1884-1890. https://doi.org/10.1109/educon45650.2020.91 25289
- [39] Hammerschlag, Z., Bick, G., & Luiz, J. (2020). The internationalization of african fintech firms: marketing strategies for successful intraafrica expansion. International Marketing Review, 37(2), 299-317. https://doi.org/10.1108/imr-05-2019-0130

- [40] Hankivsky, O., Grace, D., Hunting, G., Giesbrecht, M., Fridkin, A., Rudrum, S., ... & Clark, N. (2014). An intersectionality-based policy analysis framework: critical reflections on a methodology for advancing equity. International Journal for Equity in Health, 13(1). https://doi.org/10.1186/s12939-014-0119-x
- [41] Harris, C., Millman, K., Walt, S., Gommers, R., Virtanen, P., Cournapeau, D., ... & Oliphant, T. (2020). Array programming with numpy. Nature, 585(7825), 357-362. https://doi.org/10.1038/s41586-020-2649-2
- [42] Hart, T., Booyens, I., & Sinyolo, S. (2019). Innovation for development in south africa: experiences with basic service technologies in distressed municipalities. Forum for Development Studies, 47(1), 23-47. https://doi.org/10.1080/08039410.2019.16545 43
- [43] Harte, R., Glynn, L., Rodríguez-Molinero, A., Baker, P., Scharf, T., Quinlan, L., ... & ÓLaighin, G. (2017). A human-centered design methodology to enhance the usability, human factors, and user experience of connected health systems: a three-phase methodology. Jmir Human Factors, 4(1), e8. https://doi.org/10.2196/humanfactors.5443
- [44] Hazhirpasand, M., Ghafari, M., Krüger, S., Bodden, E., & Nierstrasz, O. (2019). The impact of developer experience in using java cryptography..

https://doi.org/10.1109/esem.2019.8870184

- [45] Heeks, R., Amalia, M., Kintu, R., & Shah, N. (2013). Inclusive innovation: definition, conceptualisation and future research priorities. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3438439
- [46] Heeks, R., Foster, C., & Nugroho, Y. (2014). New models of inclusive innovation for development. Innovation and Development, 4(2), 175-185. https://doi.org/10.1080/2157930x.2014.92898 2
- [47] Heeks, R., Foster, C., & Nugroho, Y. (2017). New models of inclusive innovation for

development ..

https://doi.org/10.4324/9781315673479

- [48] Hein, A., Schreieck, M., Riasanow, T., Setzke,
 D., Wiesche, M., Böhm, M., ... & Krcmar, H.
 (2019). Digital platform ecosystems. Electronic Markets, 30(1), 87-98. https://doi.org/10.1007/s12525-019-00377-4
- [49] Hein, A., Weking, J., Schreieck, M., Wiesche, M., Böhm, M., & Kremar, H. (2019). Value cocreation practices in business-to-business platform ecosystems. Electronic Markets, 29(3), 503-518. https://doi.org/10.1007/s12525-019-00337-y
- [50] Holeman, I. and Kane, D. (2019). Humancentered design for global health equity. Information Technology for Development, 26(3), 477-505. https://doi.org/10.1080/02681102.2019.16672 89
- [51] Hora, A., Robbes, R., Anquetil, N., Etien, A., Ducasse, S., & Valente, M. (2015). How do developers react to api evolution? the pharo ecosystem case., 251-260. https://doi.org/10.1109/icsm.2015.7332471
- [52] Ibitoye, B. A., AbdulWahab, R., & Mustapha, S. D. (2017): Estimation of Drivers' Critical Gap Acceptance and Follow-up Time at Four– Legged Unsignalized Intersection.
- [53] Igun, S. (2010). Gender and national information and communication technology (ict) policies in africa. International Journal of Ict Research and Development in Africa, 1(4), 46-58. https://doi.org/10.4018/978-1-61520-847-0.ch013
- [54] Ihirwe, F., Ruscio, D., Mazzini, S., Pierini, P.,
 & Pierantonio, A. (2020). Low-code engineering for internet of things..
 https://doi.org/10.1145/3417990.3420208
- [55] Ikolo, V. (2013). Gender digital divide and national ict policies in africa., 812-832. https://doi.org/10.4018/978-1-4666-1852-7.ch042
- [56] Ismyrlis, V. and Moschidis, O. (2015). The effects of iso 9001 certification on the performance of greek companies. The TQM Journal, 27(1), 150-162. https://doi.org/10.1108/tqm-07-2013-0091

- [57] Iyawa, G., Hamunyela, S., Peters, A., Akinsola, S., Shaanika, I., Akinmoyeje, B., ... & Mutelo, S. (2020). Digital transformation and global health in africa., 1-32. https://doi.org/10.1007/978-3-030-05325-3_6-1
- [58] Jung, N. and Windbergs, M. (2018). Raman spectroscopy in pharmaceutical research and industry. Physical Sciences Reviews, 3(8). https://doi.org/10.1515/psr-2017-0045
- [59] Jussila, J., Venho, N., Salonius, H., Moilanen, J., Liukkonen, J., & Rinnetmäki, M. (2018). Towards ecosystem for research and development of electrodermal activity applications., 79-87. https://doi.org/10.1145/3275116.3275141
- [60] Kalkanci, B., Rahmani, M., & Toktay, L. B. (2019). The role of inclusive innovation in promoting social sustainability. Production and Operations Management, 28(12), 2960-2982.
- [61] Khan, A., Majeed, S., & Shabbir, R. (2016). Designing a customer retention framework for telecommunication sector. Information Management and Business Review, 8(5), 48-60. https://doi.org/10.22610/imbr.v8i5.1459
- [62] Khorram, F., Mottu, J., & Sunyé, G. (2020). Challenges & amp; opportunities in low-code testing.. https://doi.org/10.1145/3417990.3420204
- [63] Kim, D., Kumar, V., & Kumar, U. (2011). A performance realization framework for implementing iso 9000. International Journal of Quality & Reliability Management, 28(4), 383-404.

https://doi.org/10.1108/02656711111121807

- [64] Kim, J., Choi, S., Ahn, I., Sung, N., & Yun, J. (2016). From wsn towards wot: open api scheme based on onem2m platforms. Sensors, 16(10), 1645. https://doi.org/10.3390/s16101645
- [65] Kim, S., Piccinini, D., Mensah, E., & Lynch, M. (2019). Using a human-centered design approach to determine consumer preferences for long-lasting insecticidal nets in ghana. Global Health Science and Practice, 7(2), 160-170. https://doi.org/10.9745/ghsp-d-18-00284

- [66] Kingiri, A. N. (2013). A review of innovation systems framework as a tool for gendering agricultural innovations: exploring gender learning and system empowerment. The Journal of Agricultural Education and Extension, 19(5), 521-541.
- [67] Kiptot, E. and Franzel, S. (2011). Gender and agroforestry in africa: a review of women's participation. Agroforestry Systems, 84(1), 35-58. https://doi.org/10.1007/s10457-011-9419-y
- [68] Kratzke, N. and Peinl, R. (2016). Clouns a cloud-native application reference model for enterprise architects.. https://doi.org/10.1109/edocw.2016.7584353
- [69] Langham, J. and Paulsen, N. (2018). Applying the experience effectiveness (xe) framework in the canadian public sector. Design Management Journal, 13(1), 53-69. https://doi.org/10.1111/dmj.12042
- [70] Li, L., Gao, J., Bissyandé, T., Ma, L., Xia, X., & Klein, J. (2018). Characterising deprecated android apis., 254-264. https://doi.org/10.1145/3196398.3196419
- [71] Li, L., Gao, J., Bissyandé, T., Ma, L., Xia, X., & Klein, J. (2020). Cda: characterising deprecated android apis. Empirical Software Engineering, 25(3), 2058-2098. https://doi.org/10.1007/s10664-019-09764-z
- [72] Li, Z., Liu, X., Wang, T., He, W., & Xia, C. (2020). Ghscn: a graph neural network-based api popularity prediction method in service ecosystem. Ieee Access, 8, 137032-137051. https://doi.org/10.1109/access.2020.3011439
- [73] Lim, H. (2015). Protection management for guaranteed user-driven virtual circuit services in dynamic multi-domain environments: design issues and challenges. Etri Journal, 37(2), 369-379. https://doi.org/10.4218/etrij.15.0114.0621
- [74] Ma, Q., Schmit, S., Glodt, C., & Kelsen, P.
 (2014). Combining models with code: a tale of two languages., 27-32. https://doi.org/10.1109/icgsew.2014.9
- [75] Mackey, A. and Petrucka, P. (2019). Technology as the key to women's empowerment: a scoping review.. https://doi.org/10.21203/rs.2.18788/v1

- [76] Mannell, J. (2014). Conflicting policy narratives: moving beyond culture in identifying barriers to gender policy in south africa. Critical Social Policy, 34(4), 454-474. https://doi.org/10.1177/0261018314538794
- [77] Martin, P. and Barnard, A. (2013). The experience of women in male-dominated occupations: a constructivist grounded theory inquiry. Sa Journal of Industrial Psychology, 39(2). https://doi.org/10.4102/sajip.v39i2.1099
- [78] Milek, A., Stork, C., & Gillwald, A. (2011).
 Engendering communication: a perspective on ict access and usage in africa. Info, 13(3), 125-141.

https://doi.org/10.1108/14636691111131493

- [79] Mustapha, S. D., Ibitoye, B. A., & AbdulWahab, R. (2017). Estimation of drivers' critical gap acceptance and follow-up time at four-legged unsignalized intersection. CARD International Journal of Science and Advanced Innovative Research, 1(1), 98–107.
- [80] Nakayiwa, F., Elhag, M. M., Santos, L., Kifle, D., & Tizikara, C. (2020). Strengthening higher education capacity to promote gender inclusive participation in science, technology and innovation. African Journal of Rural Development, 5(3), 65-86.
- [81] Natile, S. (2019). Regulating exclusions? Gender, development and the limits of inclusionary financial platforms. International Journal of Law in Context, 15(4), 461-478.
- [82] Ndemo, B. and Weiss, T. (2017). Making sense of africa's emerging digital transformation and its many futures. Africa Journal of Management, 3(3-4), 328-347. https://doi.org/10.1080/23322373.2017.14002 60
- [83] Nguyen, A., Hong, Y., & Gardner, L. A. (2020, June). A taxonomy of digital learning activities for digital inclusion. In Proceedings of the 28th European conference on information systems (ECIS), an online AIS conference, June 15-17, 2020. Association for Information Systems.
- [84] Orser, B., Riding, A., & Li, Y. (2019). Technology adoption and gender-inclusive entrepreneurship education and training.

International Journal of Gender and Entrepreneurship, 11(3), 273-298.

- [85] Oyedokun, O. O. (2019). Green human resource management practices and its effect on the sustainable competitive edge in the Nigerian manufacturing industry (Dangote) (Doctoral dissertation, Dublin Business School).
- [86] Pahl, C., Jamshidi, P., & Zimmermann, O. (2018). Architectural principles for cloud software. Acm Transactions on Internet Technology, 18(2), 1-23. https://doi.org/10.1145/3104028
- [87] Paunov, C. (2013). Innovation and inclusive development.. https://doi.org/10.1787/5k4dd1rvsnjj-en
- [88] Paunov, C., Planes-Satorra, S., & Ravelli, G. (2019). Review of national policy initiatives in support of digital and ai-driven innovation.. https://doi.org/10.1787/15491174-en
- [89] Petersen, I. H., & Kruss, G. (2019). Promoting alignment between innovation policy and inclusive development in South Africa. Development Southern Africa, 36(3), 351-375.\
- [90] Promotion Practice, 23(1), 25-31. https://doi.org/10.1177/15248399211003544
- [91] Reinders, S., Dekker, M., van Kesteren, F., & Oudenhuijsen, L. (2019). Inclusive development in Africa. Synthesis report series of INCLUDE, the knowledge platform on inclusive development policies, 1-60.
- [92] Rivera-Santos, M., Holt, D., Littlewood, D., & Kolk, A. (2015). Social entrepreneurship in sub-saharan africa. Academy of Management Perspectives, 29(1), 72-91. https://doi.org/10.5465/amp.2013.0128
- [93] Sahay, A., Indamutsa, A., Ruscio, D., & Pierantonio, A. (2020). Supporting the understanding and comparison of low-code development platforms., 171-178. https://doi.org/10.1109/seaa51224.2020.00036
- [94] Sanchís, R., García-Perales, Ó., Fraile, F., & Poler, R. (2019). Low-code as enabler of digital transformation in manufacturing industry.

Applied Sciences, 10(1), 12. https://doi.org/10.3390/app10010012

- [95] Sanner, T. and Nielsen, P. (2019). Software platforms for inclusive innovation., 218-230. https://doi.org/10.1007/978-3-030-18400-1_18
- [96] Smith, A., Fressoli, M., & Thomas, H. (2014).
 Grassroots innovation movements: challenges and contributions. Journal of Cleaner Production, 63, 114-124.
 https://doi.org/10.1016/j.jclepro.2012.12.025
- [97] Sparks, D. and Barnett, S. (2010). The informal sector in sub-saharan africa: out of the shadows to foster sustainable employment and equity?. International Business & Economics Research Journal (Iber), 9(5). https://doi.org/10.19030/iber.v9i5.563
- [98] Spel, C. (2016). The future of social protection in a borderless africa: social innovation for the management of risk and uncertainty amongst informal africa migrants.. Proceedings of the African Futures Conference, 1(1), 95-122. https://doi.org/10.1002/j.2573-508x.2016.tb00027.x
- [99] Urban, B. and Gaffurini, E. (2018). Social enterprises and organizational learning in south africa. Journal of Entrepreneurship in Emerging Economies, 10(1), 117-133. https://doi.org/10.1108/jeee-02-2017-0010
- [100] Vossenberg, S. (2016). Gender-aware women's entrepreneurship development for inclusive development in sub-Saharan Africa. INCLUDE knowledge platform on inclusive development policies.
- [101] Wakunuma, K. (2011). Gender and ict policy for development and empowerment., 186-207. https://doi.org/10.4018/978-1-61520-847-0.ch012
- [102] Yami, M., Feleke, S., Abdoulaye, T., Alene, A., Bamba, Z., & Manyong, V. (2019). African rural youth engagement in agribusiness: achievements, limitations, and lessons. Sustainability, 11(1), 185. https://doi.org/10.3390/su11010185